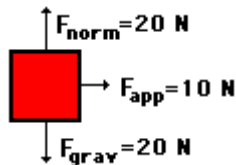


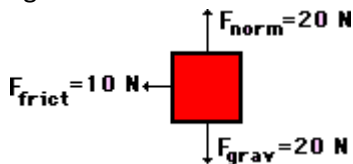
Work Problems

On many occasions, there is more than one force acting upon an object. A [free-body diagram](#) is a diagram which depicts the type and the direction of all the forces acting upon an object. The following descriptions and their accompanying free-body diagrams show the forces acting upon an object. For each case, indicate which force(s) are doing work upon the object. Then calculate the work done by these forces.

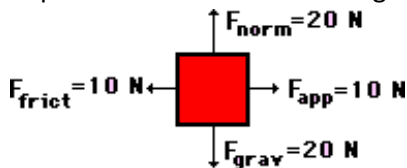
1. A 10-N force is applied to push a block across a friction free surface for a displacement of 5.0 m to the right.



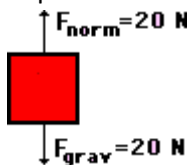
2. A 10-N frictional force slows a moving block to a stop after a displacement of 5.0 m to the right.



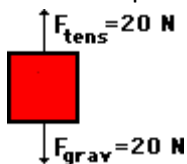
3. A 10-N force is applied to push a block across a frictional surface at constant speed for a displacement of 5.0 m to the right.



4. An approximately 2-kg object is sliding at constant speed across a friction free surface for a displacement of 5 m to the right.



5. An approximately 2-kg object is pulled upward at constant speed by a 20-N force for a vertical displacement of 5 m.



6. Ben Travlun carries a 200-N suitcase up three flights of stairs (a height of 10.0 m) and then pushes it with a horizontal force of 50.0 N at a constant speed of 0.5 m/s for a horizontal distance of 35.0 meters. How much work does Ben do on his suitcase during this entire motion?
7. Calculate the work done by a 2.0-N force (directed at a 30° angle to the vertical) to move a 500 gram box a horizontal distance of 400 cm across a rough floor at a constant speed of 0.5 m/s. (HINT: Be cautious with the units.)